N-TUTORR Transforming Learning

N-TUTORR Snapshot paper

November 2024

Employing service-oriented chatbots in higher education: case studies from ATU and DkIT

Case Study 1 – ATU Chatbot

Aims:

- ✓ To develop a Chatbot in one of the campuses in ATU (Sligo) that can provide information to students in relation to online exams
- ✓ To pilot the Chatbot and explore how it can be used in IT and other support services across all campuses in ATU

Background

Initial idea for the N-TUTORR Chatbot originated from the Q&A Chatbot that was developed in early 2021.

In the middle of pandemic IT services were receiving substantial number of requests from students.

To reduce workload, IT needed to find an easier way to deal with the requests. IT put together a simple Chatbot using Azure[1] that was available.

A list of Q&A was developed and fed into the Chatbot. This worked well but was quite limited. IT was required to regularly maintain the list of Q&A.

1 N-TUTORR Chatbot exams testing Version 1.0

- Using similar set-up from the previous Q&A Chatbot, the first version was developed in early 2024.
- Q&A with the focus on exams were developed and fed in using Open AI.

Outcome:

- Version 1.0 was tested by student advisors.
- This version wasn't tuned well, and to questions it could not give an answer the Chatbot provided witty statements in an unprofessional manner or offered humorous responses.
- Version 1.0 was not ready for launch.
- The pilot provided essential knowledge on capabilities of a Chatbot.

2 N-TUTORR Chatbot copilot studio Version 2.0

- In spring 2024 Chatbot Version 2.0 was developed.
- The AI model was used was not the latest version and lacked some advanced instructions.

Outcome:

- This version was pulled quickly as it was not working well.
- The Chatbot gave answers to questions it should not had the access to.

3 N-TUTORR Chatbot Version 3.0

- In Summer 2024 Chatbot Version 3.0 was developed.
- A separate Azure subscription was used to access advanced functions.
- Data centres across the country and beyond were explored to locate the latest version of OpenAI GPT models. A data centre in Sweden was selected as a suitable centre to provide the latest version of the AI model.
- Using the latest AI technology, the Chatbot could read the Q&A that were fed in and using NLP (Natural language processing) it could interpret questions and provide answers efficiently. The Chatbot was also able to index and rank the information using RAG[2] which aided in answering questions. This meant that far less manual work was needed in structuring the answers, as the model would create its own answers.

Outcome:

- The Chatbot Version 3.0 was tested in October 2024.
- Feedback on V3 was generally very positive but a production version will require data governance and an ATU AI-policy in place first.

Azure[1] - cloud computing platform operated by Microsoft.
RAG[2] – Retrieval augmented generation is being used to pre-select the correct data before letting the large language model reason over it.

Case Study 1 – ATU Chatbot

Challenges

- It was challenging to find a **right model** as the latest OpenAI model was not available in the Irish datacentre. It took a bit of research to locate the latest version within the EU considering data protection regulation. The latest version was available in the Swedish datacentre.
- The Chatbot Version 3.0 infrastructure was deployed across the Irish and Swedish datacentres, with the data kept in Ireland and the AI processing done in Sweden. This kept data close to the source, but it could still make use of the latest OpenAI models. Other datacentres offered the same services, but EU ones were selected to ensure compliance with EU data regulations.

Learnings

- Using the latest model of AI the **Chatbot Version 3.0 can paraphrase** the material, so the data does not need to be structured to the same extend as in previous versions.
- Using separate Azure subscription allows for more **data control** and ensures **data protection**.
- Accessing the **history of questions** may be useful to assess the type of questions being asked and/or type of question are not being answered to **identify blind spots** and areas for improvement.
- Microsoft AI regularly issue updates and makes changes to the platform; thus, it would be essential to tweak the model, review the permissions and settings to **keep up to date with the changes**.
- To ensure information is in date **the data storage** must be **updated** if changes are being made.
- Two centres involved in the running of the Chatbot although located in different countries (Ireland and Sweden) use the **same cloud platform**, and the **same subscription** thus can communicate with each other effectively, efficiently and securely.
- Putting in place ATU-wide data governance will be one of the most crucial steps in preparing for the use of AI models, to ensure sensitive or personal data isn't accidentally or maliciously leaked via a chatbot.

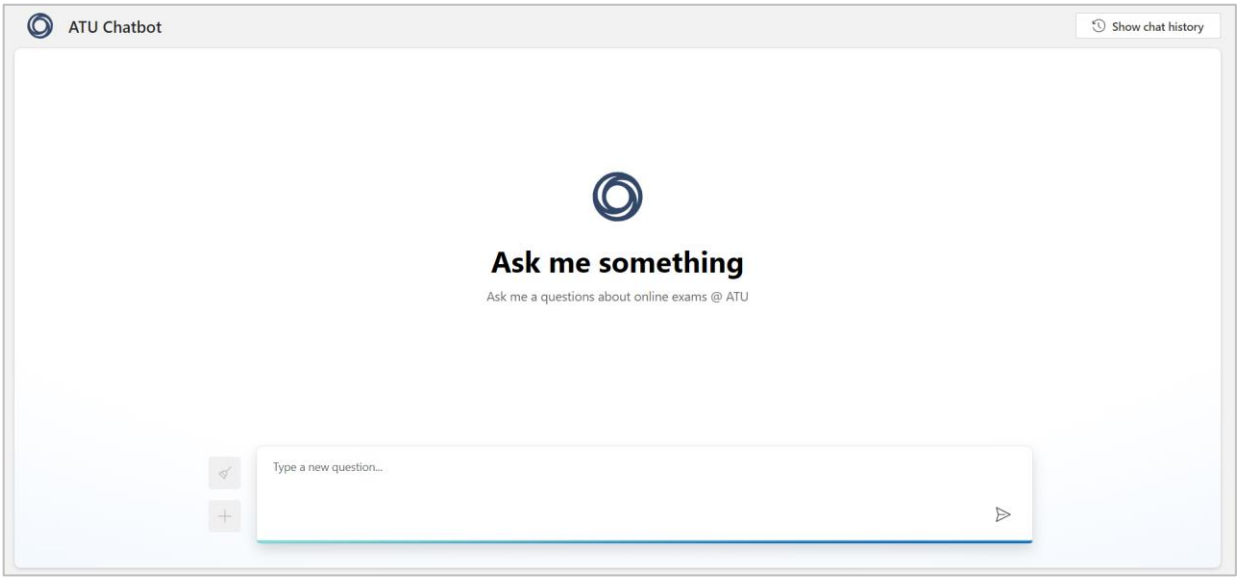

Figure 1: ATU Chatbot on exams

Case Study 2 – DkIT Academic Integrity Chatbot

Local project name: EU-GENIE

Aim:

✓ To add an interactive chatbot platform to the existing DkIT Moodle Student Support Hub. The goal was to enhance the support available to students via the Hub by directly answering questions.

Discovery Phase

- A pilot Chatbot using Azure's free version of cloud services was developed from scratch in early 2024.
- A set of 'Frequently Asked Questions' from the Student Learning and Development Centre (SLDC) were fed into the Chatbot, along with including the corresponding answers.
- The Chatbot was geared to be positioned on Moodle, while also identifying the need for a secure landing zone within Azure.

Outcome of discovery phase

- It was clear that the pilot Chatbot was not flexible and responsive enough. It was very keyword focused and required quite rigid questions.
- It was clear that additional development expertise and input was required and an external consultancy service, Ergo, was engaged.
- Weekly collaboration meetings with the consultant allowed iterative planning to meet the needs of all stakeholders.

Narrowing focus

- Following consultation with the external partners, it became clear that development of a full service Chatbot, that could deal with all the student supports and services would be a very significant project, requiring resources beyond the scope of this pilot.
- To narrow the focus, it was agreed the Chatbot would focus on two primary areas of student support, namely:
  - Academic Integrity
  - Wellbeing

Further development

- As testing progressed, there were concerns about its ability to handle questions about very sensitive wellbeing issues. The work required to address these was outside the scope of the pilot.
- Hence, it was agreed to focus specifically on Academic Integrity – a key N-TUTORR theme.

Academic Integrity Chatbot

- Relevant materials (i.e. guides, policies, support tools) were collated and shared with the external partners.
- The Chatbot then went through a significant staff and student user acceptance testing phase.

Testing phase

- In September 2024, the DkIT Academic Integrity Chatbot was launched for testing. Relevant staff and N-TUTORR student champions were involved in this phase of the pilot.
- Feedback was collected and shared with the external consultants for further enhancement.
- In October 2024 the Chatbot went live on DkIT's Moodle platform.

Outcome and feedback following testing phase and Moodle integration

- The Chatbot is functioning well and is able to provide answers on Academic integrity effectively.
- The Chatbot is situated on the Moodle Student Support Hub and can easily be found and accessed by students.
- Students who tested the Chatbot did not find any difficulties in using the platform.
- Some students suggested they would have liked the Chatbot to address them by their first name.
- Users who tested the Chatbot suggested that to increase the awareness among students the bot should be promoted widely and regularly across DkIT.
- Plans are in place for a formal launch and to integrate this interactive student support into the suite of DkIT Academic Integrity resources available.

Case Study 2 – DkIT Academic Integrity Chatbot

Local project name: EU-GENIE

Challenges

- The project required a lot of self-directed learning and team effort. However, it became an impactful project involving a significant **number** of **internal** and **external stakeholders -** and **collaboration**.
- The project was highly **complex** and **challenging**, requiring significantly more **resources** than was anticipated at the onset. However, the narrow focus assisted in moving the project forward in the development phase.
- The consultation involved a **high level** of ongoing **communication**, which was key to its success.
- **Access** to **material** and seeking **permissions** requires wide consultation across the Institute.
- Ensuring the chatbot **remains solely focused on its primary topic.** For example, we needed to ensure the Chatbot did not attempt to answer questions around sensitive topics, and hence established a process should this occur. In instances such as this, the system can remind the user it is there to specifically deal with academic integrity queries yet point them to an on-site service for further support.

Learnings

- **Students can benefit from interactive tools** to support academic integrity in a meaningful and personalised way (supporting relevant policy/guideline documents that are provided).
- **Integrating and controlling AI** in chatbots **requires expertise, agreed approaches,** and **ongoing funding. Considerations** around tone, freedom are expression and GDPR are important to reflect on.
- Longer term maintenance of an Azure based Chatbot requires **significant support** and **resources.**
- **Engagement** and collaboration with the **wider local team** around academic integrity was **essential to our success**. If the bot is ever to **expand** and include other student services, it would require **additional resources**, **wide consultation**, and **further collaboration.**
- The **Collaboration** with ATU colleagues on this pilot was **effective** and **supported overall success.** A trusted space to share practice, experience and ideas was key.

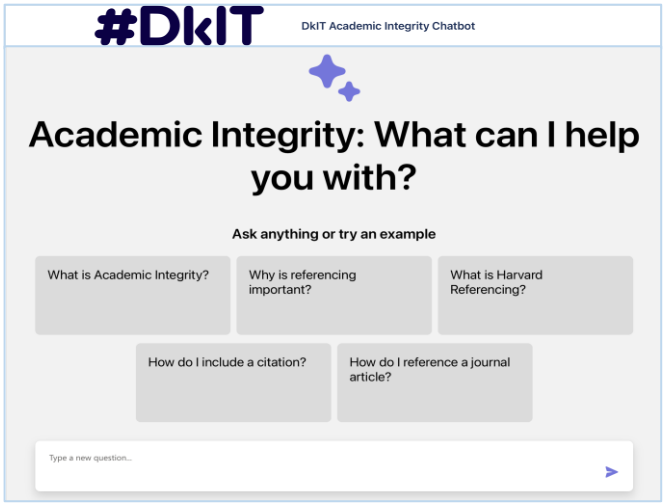

Figure 2: DkIT Academic Integrity Chatbot

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This snapshot paper is designed for discussion and intended to serve as a foundation for dialogue and collaboration.

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